PATENT
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Applicants : Masaaki OYAMADA et al. Art Unit: 1762
Application No.: 10/820,025 Examiner: Tsoy, E.
Filing Date: April 8, 2004
Title : CONDUCTIVE ELECTROLESSLY PLATED POWDER AND METHOD FOR MAKING SAME

Commissioner for Patents
P.O. Box 1450
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DECLARATION UNDER 37 CFR 1.132

Sir:

I, Shinji Abe, do declare and state as follows:

I am one of the applicants of the above-identified application;

I have been employed by NIPPON CHEMICAL INDUSTRIAL CO., LTD for 10 years as a researcher in the field of conductive electroless plated powders;

I have read all of the Office Actions in the above-entitled application, and have read and am familiar with each of the references cited in the Office Actions by the Examiner; and

The following experiments were carried out by me or under my direct supervision and control and the results are true and correct to the best of my knowledge.

I. Object

The purpose of this experiment is the following (1) and (2):

(1) To verify that grain boundaries of a nickel film of electroless nickel plated powder, which is produced according to the method described in Example 2 of Japanese Unexamined Patent Application Publication No. 1-242782, are recognized in the thickness direction of the nickel film when observed with a scanning electron microscope at a magnification of up to 100,000.

(2) To verify that even if electroless plating is performed using the wastewater of electroless plating after use for the production described in (1), an initial thin film of nickel is not formed on the surface of a core powder.

II. Brief Description of the Drawing

FIG. 1 is a SEM image (magnification of x 100,000) showing the cross-section in the thickness direction of the nickel film of the electroless nickel plated powder obtained in Experiment 1.

III. Experiments

(1) Experiment 1

An experiment was carried out according to the description at page 7, lower right column, line 17 to page 8, upper right column, line 10 of Japanese Unexamined Patent Application Publication No. 1-242782 (see page 22, line 19 - page 24, line 11 of the translation). As the complexing agent, tartaric acid, which is described in Example 4 in Table 4 at page 8, lower left column of the patent application publication, was used. However, the amount of each of the solution **a** and the solution **b** added was increased from 86 ml to 800 ml, the solution **a** and the solution **b** constituting the electroless plating solution. The reason for the increase in the amount is that by increasing the thickness of the nickel film formed by electroless plating, SEM observation is facilitated.

(2) Experiment 2

According to the description at page 7, lower right column, line 17 to page 8, upper left column, line 19 of Japanese Unexamined Patent Application Publication No. 1-242782 (see page 22, line 19 - page 23, line 22 of the translation), catalyzing treatment was performed using palladium on the surface of a spherical phenol resin

serving as a core powder. The wastewater of electroless plating after use in Experiment 1 (1,000 ml) was added to an aqueous suspension containing the core powder subjected to the catalyzing treatment, and formation of an initial thin film of nickel was attempted.

IV. Result and Discussion

(1) Results of Experiment 1

The electroless nickel plated powder obtained in Experiment 1 was embedded in an epoxy resin, followed by curing. Then, the resin was cut to expose a broken-out section. Using the broken-out section as a measuring object, the cross-section in the thickness direction of the nickel film of the electroless nickel plated powder was observed with a SEM. The result thereof is shown in Fig. 1 below. The SEM image shown in Fig. 1 has a magnification of × 100,000. As is evident from the result shown in Fig. 1, the nickel film was composed of an aggregate of many crystal grains. However, the grain boundaries were recognized in the thickness direction of the nickel film.

(2) Results of Experiment 2

The surface of the core powder obtained in Experiment 2 was observed with a SEM, and also elemental analysis was performed for nickel using an X-ray microanalyzer (EPMA). As a result, it was confirmed that nickel was not present on the surface of the core powder.

V. Conclusion

(1) Conclusions of Experiment 1

The grain boundaries of the nickel film of electroless nickel plated powder, which is produced according to the method described in Example 2 of Japanese Unexamined Patent Application Publication No. 1-242782, are recognized in the thickness direction of the nickel film when observed with a scanning electron microscope at a magnification of up to 100,000.

(2) Conclusions of Experiment 2

Even if electroless plating is performed using the wastewater of electroless plating after use for the production in Experiment 1, an initial thin film of nickel is not formed on the surface of the core powder.

I further declare that all statements made herein of

my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: October 24, 2007

Shinji Abe

Shinji ABE

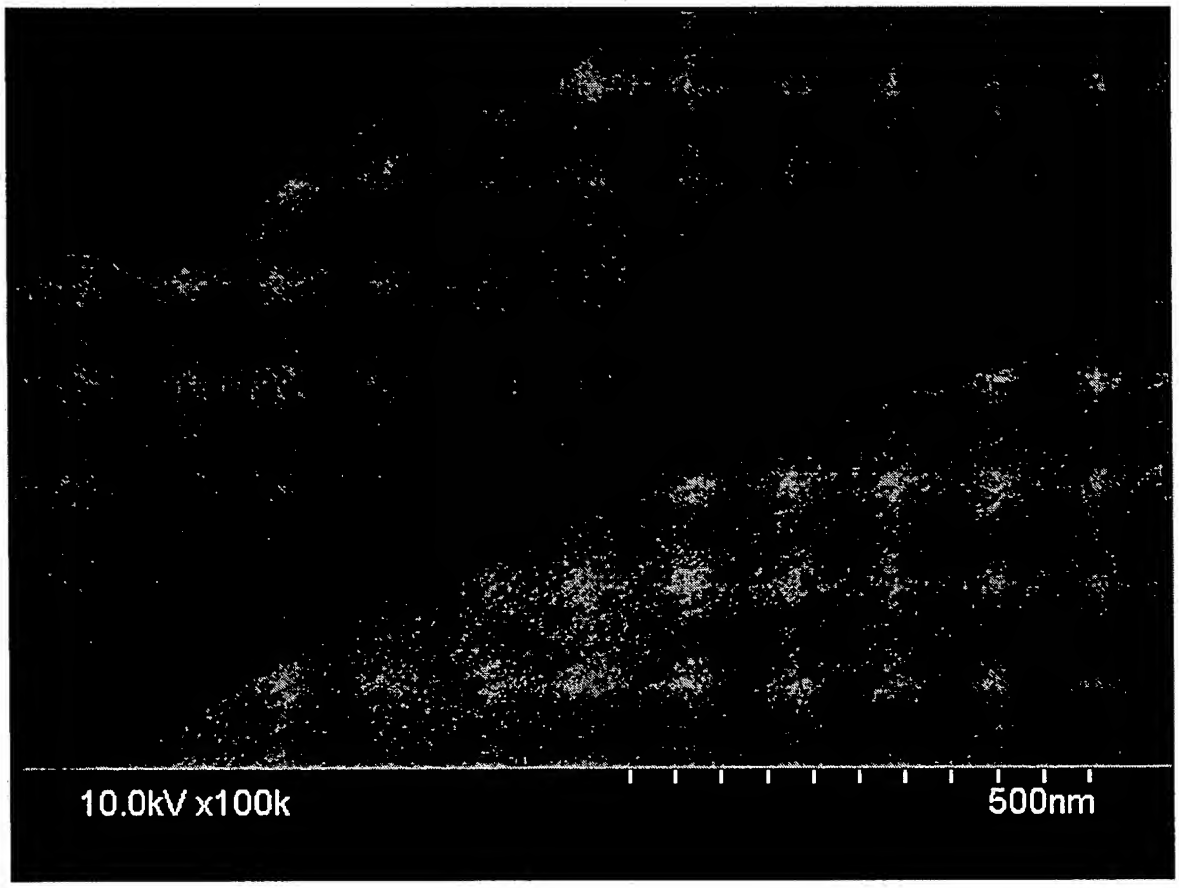

Fig. 1